

**The United States Department of Energy (DOE)  
and  
the European Atomic Energy Community  
represented by  
The Commission of European Communities (EURATOM)  
for  
Advanced Video Surveillance Technology Development**

**1. *Introduction***

Pursuant to Article 3.1 of the Agreement, signed on January 6, 1995, between DOE and EURATOM in the field of nuclear materials safeguards research and development, DOE and EURATOM (the Parties) undertake to carry out a cooperation effort on the development of advanced video surveillance technologies.

**2. *Scope of Work***

This Action Sheet provides for development and testing activities and, in particular, design and implementation of a demonstration video surveillance system that provides image processing-based change and motion detection, region of interest processing, and data compression/review capabilities. The work performed under this Action Sheet shall be performed at the Los Alamos National Laboratory (LANL) and the EURATOM headquarters in accordance with the terms and conditions of the Agreement.

**3. *Program Management***

LANL is responsible for development of advanced video surveillance and review techniques, EURATOM is responsible for providing to LANL specifications and other information required for completion of the joint project. Work to be done is identified in Appendix I and is limited to techniques for nuclear safeguards applications. Appendix II identifies key personnel associated with this project.

DOE and LANL shall work directly with EURATOM in planning tasks and resolving programmatic and technical questions. LANL shall start by developing and circulating a work plan with projected milestones for each task and update the work plan with EURATOM concurrence as work progresses,

LANL shall prepare a brief, letter format quarterly progress report on each task and circulate them to DOE, EURATOM, and other pertinent organizations as requested by EURATOM.

LANL and EURATOM shall prepare and present written and oral reports at meetings of the project coordinators as established under Article 4 (Management) of the Agreement.

#### ***4. Financial Management***

EURATOM shall make a cash contribution in a sum up to a maximum of \$153,000 in US dollars to conduct the activities related to the development of advanced video surveillance and review techniques as defined in Appendix I of this Action Sheet.

All contributions by EURATOM shall be due and payable within sixty days of receipt by EURATOM of an invoice from DOE.

DOE shall be responsible for the budget planning and financial management and shall make best efforts to complete the EURATOM funded activities described in Appendix I satisfactorily and within the cash contribution by EURATOM. DOE costs are determined in accordance with DOE's policy for costing work it performs for others as set forth in 10 CFR Part 1009. The total cost to EURATOM for DOE's performance of work under this Action Sheet shall not, without EURATOM's prior consent, exceed the contributions set forth above.

The following payment schedule has been agreed:

- i) First payment 45,900 USD upon signature.
- ii) Second payment 55,100 USD upon completion of task 2.
- iii) Third payment 38,000 USD upon completion of task 4.
- iv) Final payment 14,000 USD upon completion of all tasks.

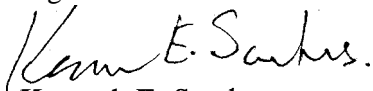
#### ***5. Duration and Termination***

The Action Sheet shall enter into force upon the later date of signature, and shall continue in force for one year period, or until mutually agreed by the parties that all activities under this Action Sheet are completed.

For the United States

Department of Energy

Signature:

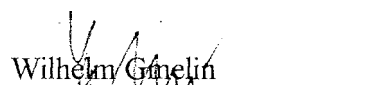


Kenneth E. Sanders  
Director International Safeguards Division

For the European Atomic Energy  
Community

Commission of the European  
Communities

Signature:



Wilhelm Gmelin  
Director Euratom Safeguards  
DG XVII-Energy

Date: 04. XII. 1995

## Appendix I

### Description of Tasks

#### 1. OBJECTIVE

The Safeguards Systems group at LANL **has** experience in developing video-based surveillance technologies designed to meet the requirements of US/domestic nuclear materials safeguards and security. Using existing LANL systems as a base, LANL and EURATOM will design and implement a demonstration video surveillance system that will have image processing-based change and motion detection, region of interest processing, and data compression/review capabilities. This system will be delivered to EURATOM for evaluation and testing in accordance with the detailed work plan to be developed as the first action upon entry into force of this Action Sheet.

#### 2. SCOPE

This project entails development and testing activities and, in particular, design and implementation of a demonstration video surveillance system that provides image processing-based change and motion detection, region of interest processing, and data compression/review capabilities. Design activities include discussions between LANL and EURATOM regarding system requirements and specifications, and the development of design documentation by LANL.

Implementation of design includes, for hardware, evaluation of requirements and specifications, followed by appropriate hardware designation based on processing, cost, and maintenance requirements; for software, implementation of change and motion detection, region of interest processing, data compression, data review, system management, and user interface software.

Evaluation and testing of the system will be performed at EURATOM' headquarters by EURATOM and LANL personnel.

### 3. TASKS

#### 3.1 Develop Detailed Work Plan

A detailed work plan is to be developed by LANL and EURATOM that will describe milestones, deliverable, evaluation, and testing activities.

#### 3.2 Change and Motion Detection Software

Change and motion detection software will be provided allowing front-end triggering of cameras based on real-time image processing and analysis.

#### 3.3 Region of Interest Processing

Region of interest software will be developed allowing surveillance to be performed on specific, user defined regions. Three levels of sensitivity will be provided.

#### 3.4 Data Compression and Review

Image compression/decompression software will be developed and/or integrated into the demonstration system.

#### 3.5 System Management and User Interface Software (SW)

System management and user interface software will be developed by LANL to meet the demonstration system requirements as determined by LANL and EURATOM.

#### 3.6 Evaluation and Test (T/E) Plan

System evaluation and testing will be performed at EURATOM by EURATOM and LANL personnel. Initial system hardware will be provided using existing EURATOM equipment; system software and revisions will be provided to EURATOM by LANL in accordance with the detailed work plan.

### 3.7 Project Schedule

| Date     | Action   | Responsible                   |
|----------|--|-------------------------------|
| Month 1  | Develop Detailed Work Plan                                   | LANL/EURATOM                  |
| Month 2  | Design & Implement Graphical User Interface                  | LANL                          |
| Month 3  | Design & Implement Change Detection SW                       | LANL                          |
| Month 4  | Deliver rev-1 SW for T/E to EURATOM                          | LANL                          |
|          | Implement Region of Interest SW                              | LANL                          |
| Month 6  | Provide Feedback on rev-1 SW Meeting of Project Coordinators | EURATOM<br>LANL/EURATOM       |
| Month 7  | Deliver rev-2 SW for T/E to EURATOM                          | LANL                          |
| Review   | Implement Data Compression & LANL                            |                               |
| Month 10 | Provide Feedback on rev-2 SW                                 | EURATOM                       |
|          | Deliver rev-3 SW for T/E to EURATOM                          | LANL                          |
|          | Implement System Management SW                               | LANL                          |
| Month 12 | Provide Feedback on rev-3 SW Meeting of Project Coordinators | E U R A T O M<br>LANL/EURATOM |
|          | Deliver Final Prototype SW to EURATOM                        | LANL                          |

## **Appendix II**

### **Key Personnel**

#### **EURATOM**

Winfried Kloeckner  
EURATOM Safeguards Directorate  
Cube 023  
L-2920 Luxembourg  
Luxembourg

Peter Chare  
EURATOM Safeguards Directorate  
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Luxembourg

#### **Department of Energy**

##### **1. DOE Headquarters**

Kenneth Sanders, Director  
International Safeguards Division  
Office of Arms Control and Nonproliferation (NN-44, GA017)  
US Department of Energy  
1000 Independence Ave., SW  
Washington, DC 20585

Russell Hibbs  
International Safeguards Division  
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2. DOE-Albuquerque Operation Office

James R. Anderson, Director  
Science and Technology Transfer Division  
DOE/Albuquerque Operations Office  
P.O. Box 5400  
Albuquerque, NM 87115

3. Los Alamos National Laboratory

Cheryl Rodriguez  
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Group NIS-7, MS E541  
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Jack Markin  
Safeguards Systems  
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## **COST BY TASK**

**Task 1 - Develop a Detailed Work Plan:** A detailed work plan is to be developed by LANL and EURATOM that will describe milestones, deliverables, evaluations, and testing activities.  
**Cost: \$ 7650**

**Task' 2 - Design and Implement a Graphical User Interface:** A graphical user interface will be designed and implemented to provide real-time display of the change detection images.  
**cost: \$22950**

**Task 3 Provide Change and Motion Detection Software:** Change and motion detection software will be provided allowing front-end triggering of cameras based on real-time image processing and analysis. **cost: \$15300**

**Task 4 - Develop Region of Interest Software:** Region of interest software will be developed allowing surveillance to be performed on specific, user defined regions. Three levels of sensitivity will be provided. **Cost: \$38250**

**Task 5 - Develop Image Compression/Depression Software:** Image compression\depression software will be developed and\or integrated into the demonstration system. **Cost: \$38250**

**Task 6 - Develop System Management and User Interface Software:** System management and user interface software will be developed by LANL to meet the demonstration system requirements as determined by LANL and EURATOM. **cost: \$15300**

**Task 7 - Perform System Evaluation and Testing:** System evaluation and testing will be performed, at EURATOM by EURATOM and LANL personnel. Initial system hardware will be provided using existing EURATOM equipment; system software and revisions will be provided to EURATOM by LANL in accordance with the detailed work plan. **cost: \$15300**

**TOTAL COST: \$153000**